

Future Intel Mobile PC Processors

Bob Jackson
Principal Engineer

Mobile Platforms Group
Intel Corporation

October 15, 2001



Key Points

✧ Performance and Power Leadership
in 2001

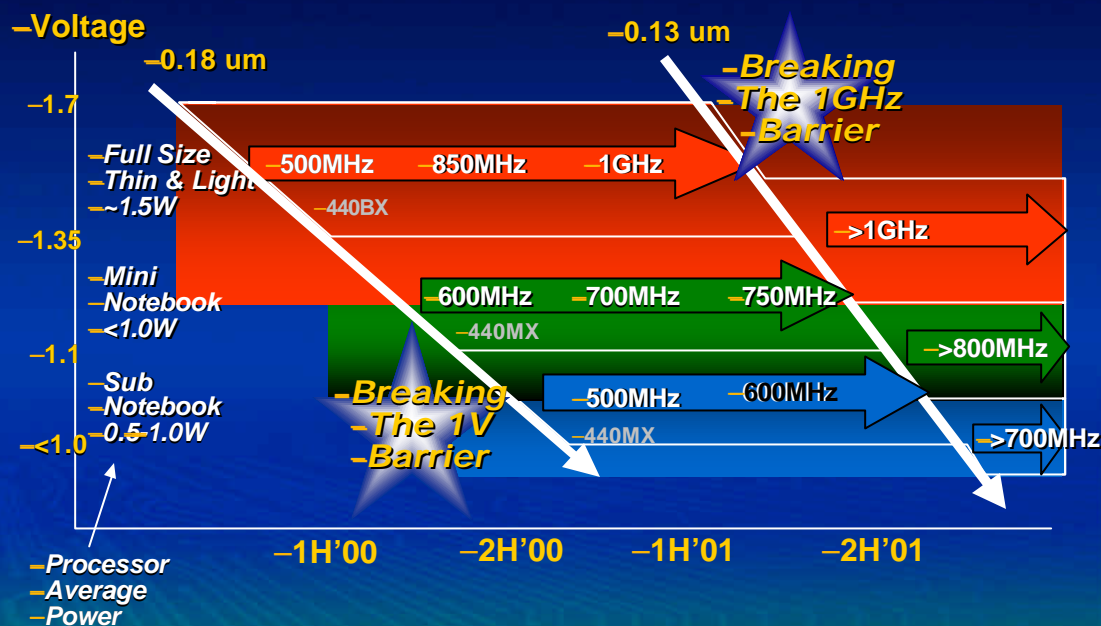
✧ Mobile Intel Pentium® 4 Processor
Extends Leadership in 2002

✧ Banias Processor Brings Mobile
Specific Design in 2003



What Did Intel Say at MPF '00..

—Mobile Product Roadmap



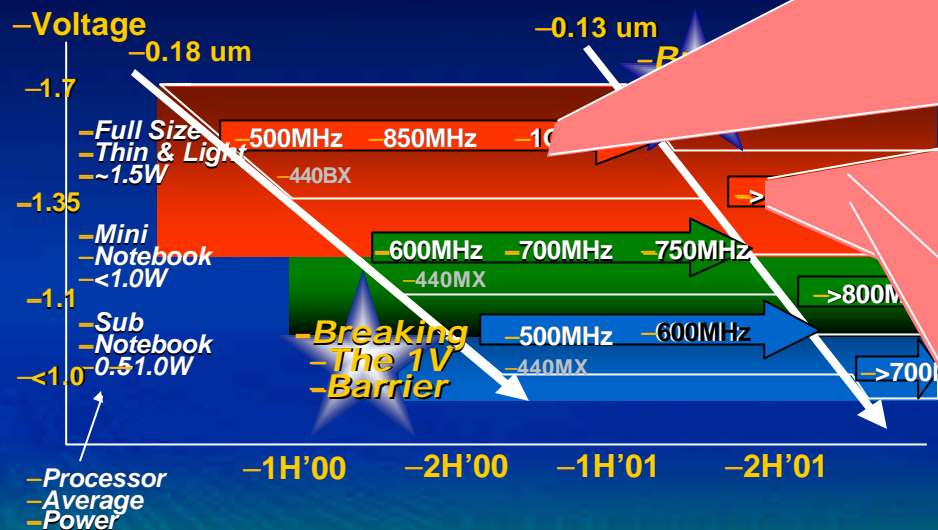
intel

intel®

Copyright © Intel Corporation 2000

2001: A Year in Review

—Mobile Product Roadmap



Full-Size / Thin & Light

Launched
Mobile Intel Pentium® III
Processor 1 GHz
in March '01

Launched
Mobile Intel Pentium® III
Processor-M 1.13 GHz
in July '01

Launched
Mobile Intel Pentium® III
Processor-M 1.2 GHz
in October '01

intel

Copyright © Intel Corporation 2000

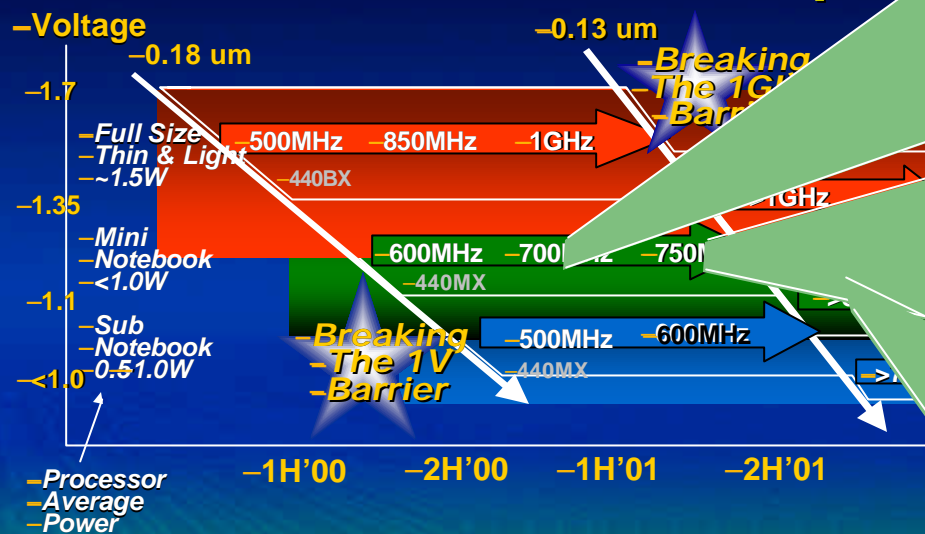
3

intel

Highest Performance in Mobile PCs

2001: A Year in Review

—Mobile Product Roadmap



Mini Notebook

Launched
Low Voltage Mobile Intel
Pentium® III Processor
700MHz
in Feb '01

Launched
Low Voltage Mobile
Intel Pentium® III
Processor 750MHz
in May '01

Launched
Low Voltage Mobile Intel
Pentium® III Processor-M
800MHz
in October '01



Copyright © Intel Corporation 2000

-3

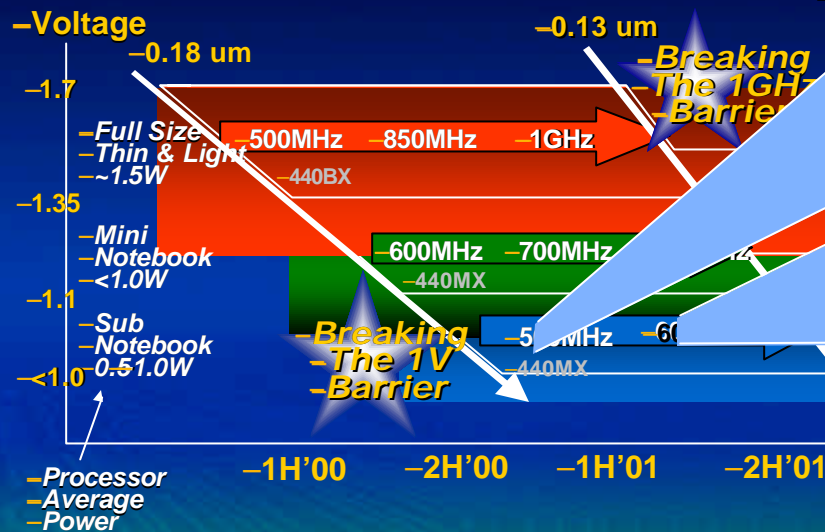


Best Product For Mini Notebook

2001: A Year in Review

Sub Notebook (and Tablet PC)

—Mobile Product Roadmap



Launched
Ultra Low Voltage Mobile
Intel Pentium® III
Processor 500MHz
in Jan '01

Launched
Ultra Low Voltage Mobile
Intel Pentium® III
Processor 600MHz
in May '01

Launched
Ultra Low Voltage Mobile
Intel Pentium® III
Processor-M 700MHz
in October '01

intel

Copyright © Intel Corporation 2000

-3

intel

Lowest Power for Sub-NB and Tablet PC

In Summary.....

In 2001, Intel Delivered...

- Highest Performance and Lowest Power in Mobile PCs
- Leadership in Every Mobile PC Segment

.....On Time, Every Time

Intel Continues to Build On These Strengths

- 2002: Mobile Intel Pentium® 4 Processor
- 2003: Mobile Banias Processor

intel

The Mobile Value Vectors

High
Performance

Long Battery
Life

Seamless
Wireless
Connectivity

Thinner and
Lighter
Form Factors

intel

Intel Mobile Platform Strategy

Deliver The Best Processor for Each Mobile PC Segment

- Highest Performance
- Low average power
- Thinner, lighter systems

Provide Scalable Mobile Platforms

- Mobile optimized chip-set families
- Single platform design across all segments
- Software and hardware compatibility
- Intel wireless solutions



2002: Intel Pentium® 4 Processor Comes to Mobile

✍ Brings Performance Benefits of Intel Pentium® 4 Processor to Mobile

- Intel NetBurst™ Microarchitecture
- 400 MHz Processor System Bus
- Streaming SIMD Extension 2

✍ Meets the needs of Mainstream Mobile PCs

- Full-Size and Thin-n-Light Segments
- 0.13μ process
- Low profile bare die μFCPGA package

✍ Includes power management features

- Enhanced Intel SpeedStep™ Technology
- Deeper Sleep Alert State

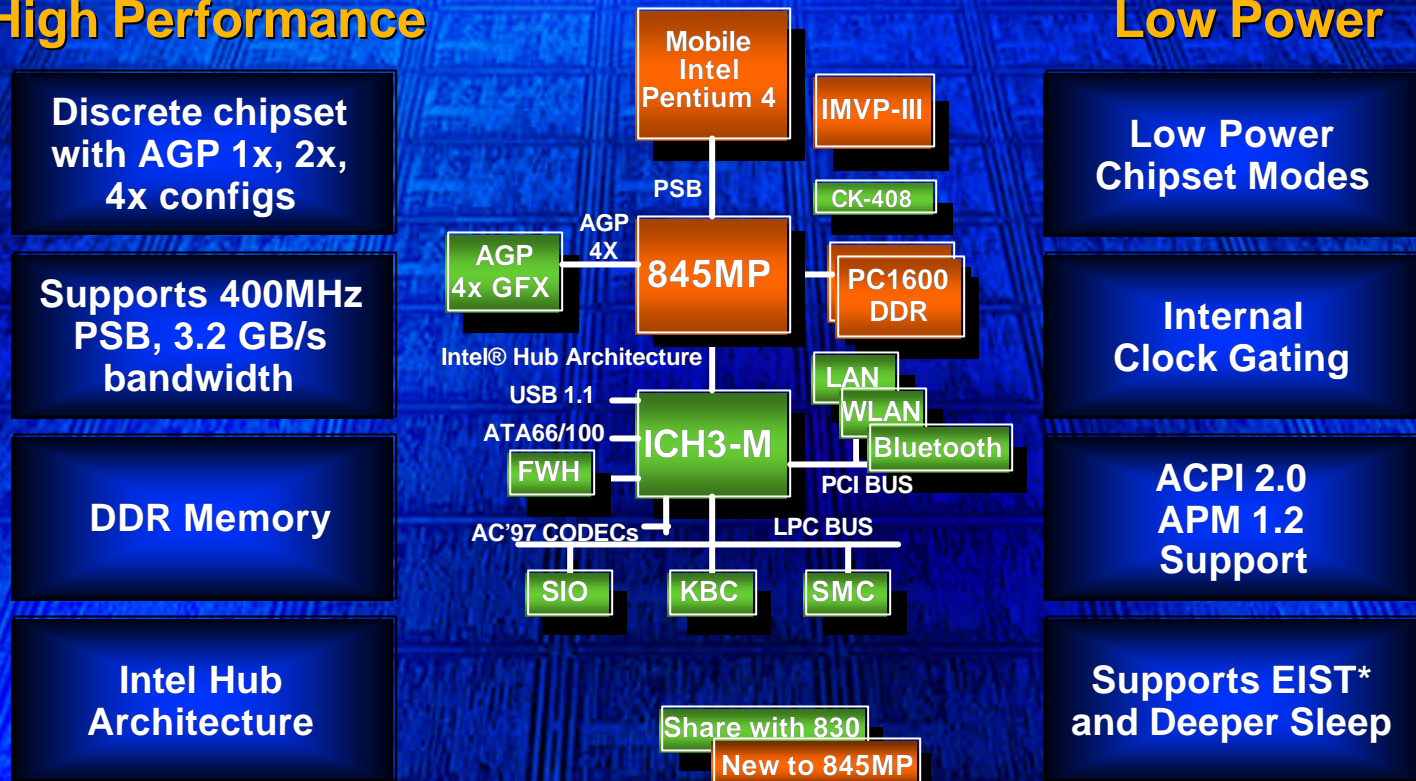
✍ Schedule: >1.5GHz (1H'02), 2.0GHz (2H'02)



Targeted for Mainstream Mobile PCs

Intel 845MP Chipset

Low Power



Delivering Complete Platform Solutions

* Enhanced Intel SpeedStep™ Technology

Mobile Intel Pentium® 4 Processor

Intel 0.13 μ Process Advantages

0.13 Micron is Intrinsically Lower Power

- Lower voltage
- Lower switching capacity

Dual Vt Devices = High Performance and Low Power

- Circuit design flexibility to optimize performance vs leakage power
- High Vt devices are used for most circuits
- Low Vt devices are used selectively in speed critical paths

High Performance Interconnects

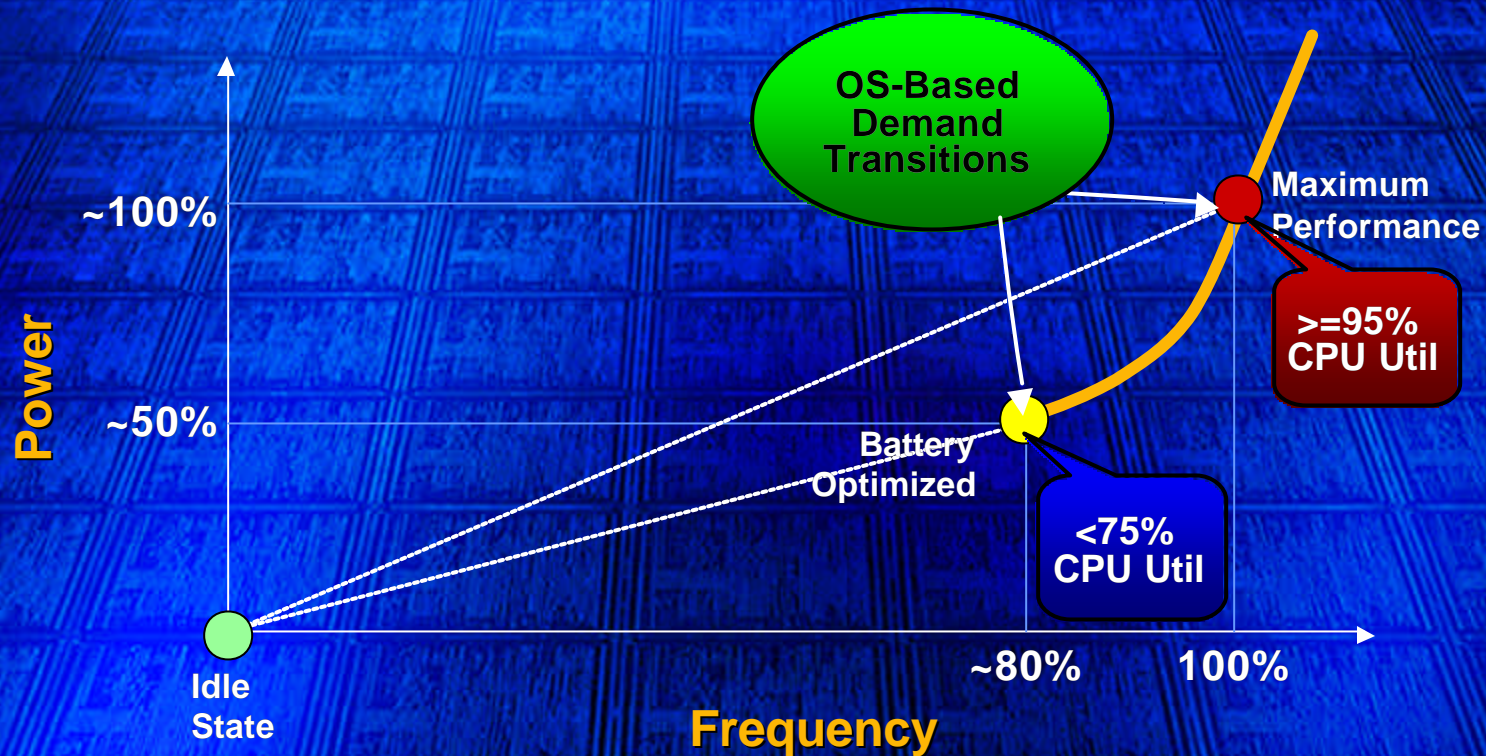
- 6 layers of high aspect ratio copper metal
- Low-K dielectric
- 40% RC delay improvement over 0.18 μ technology



Ideally Suited for Mobile PCs
Plans in Place for Aggressive Ramp

Mobile Intel Pentium® 4 Processor

Enhanced Intel SpeedStep™ Technology



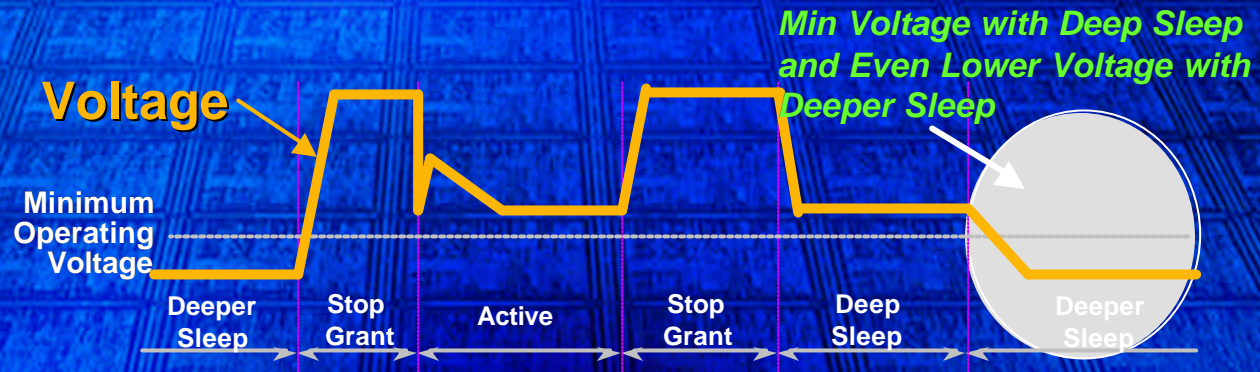
Long Battery Life Without Sacrificing Performance

Mobile Intel Pentium® 4 Processor

Delivering Long Battery Life

IMVP* III
Intelligent
regulator
reduces
Idle power

* Intel Mobile Voltage
Positioning



$$\text{Power} = C_s V^2 f + g_1 V^3 + g_2 V^5$$

Sub-threshold Gate

20% Voltage Reduction = <50% Leakage Power

ii

Deeper Sleep Alert State = Ideal Idle State

Mobile Intel Pentium® 4 Processor

2002: In Summary....

Bringing Highest Performance and Low Power to Mainstream Mobile PCs

- High Performance Architecture
- 0.13 μ Process
- Enhanced Intel SpeedStep™ Technology
- Deeper Sleep Alert State
- Intel 845MP Chipset

Coming Soon

- >1.5 GHz in 1H'02
- 2.0 GHz in 2H'02



What's Next.....

2003: Next Generation Mobile Computing with Banias

High
Performance



Long
Battery Life



Seamless
Connectivity



Thinner/Lighter
Form Factors



River in Israel

New Mobile Specific Design, Scheduled for 1H'03

- ✦ Banias Mobile Processor
- ✦ Mobile Chipset

Designed for Mobile From the Ground Up



Mobile Banias Platform

Delivering the Mobile Value Vectors

Implements New Design Methodology

- Maximize Performance while Lowering Power
- Scale across all Mobile PC segments

Incorporates a Series of New Architectural, Circuit, and Logic Techniques

Examples:

- Micro Ops Fusion for Higher Performance
- Aggressive Clock Gating for Lower Average Power
- Device Sizing Techniques for Lower Power/Leakage



Summary

✍ Performance and Power Leadership
in 2001

✍ Mobile Intel Pentium® 4 Processor
Extends Leadership in 2002

✍ Banias Processor Brings Mobile
Specific Design in 2003

intel